AMENDMENT NO. 1 APRIL 2019
TO
IS 1571 : 2018 AVIATION TURBINE FUELS, KEROSENE TYPE, JET-A-1 — SPECIFICATION

(Tenth Revision)

(*First cover page, English title*) — Substitute 'Kerosene' *for* 'Kerosine'.

(*Second cover page*, *Foreword*, *para* 3) — Insert the following at the end:

'This Amendment No. 1 is being issued in order to align the specification with DEF STAN 91-091 (Issue 10, 28 September 2018) and AFQRJOS Issue 30-November 2018.'

(*Second cover page*, *Foreword*, *para* 7, *line* 6] — Substitute 'Jet Fuel' *for* 'et Fuel'.

(*Page* 1, *clause* **1.2**) — Insert the following new clause:

'**1.3** Blending of ATF (kerosene type, Jet A-1) with synthetic hydrocarbons (*see* IS 17081) up to 50 percent may be used. The fuel after blending shall meet the requirements of this specification, to use in appropriate aircraft fitted with turboprop or Jet engines.'

(*Page* 1, *clause* **2**) — Substitute the following:

[P : 25/Sec : 1] : 2018/ ISO 3104 : 1994	Transparent and opaque liquids, Section 1 Determination of kinematic viscosity and calculation of dynamic viscosity (*second revision*)

for

[P : 25] : 1976	Determination of kinematic and dynamic viscosity

[*Page* 3, *clause* **3.2.3.2**, b), *Note*] — Substitute the following for the existing:

'NOTE — A suitable method for the determination of SDA concentration at the point of manufacture is IP 568 or ASTM D7524.'

(*Page* 3, *clause* **3.2.4.2**, *Note*, *Informal Table, row* 8, *col* 4) — Substitute'9' *for* '11'.

(*Page* 3, *clause* **3.2.7.3**) — Insert the following new clause:

'**3.2.8** *Blending Component*

Synthesized Hydrocarbons as specified in IS 17081 can be blended up to 50 percent, *max*, *v*/*v* with this conventional Jet Fuel. Such blended fuel shall meet the requirement prescribed in IS 17081and Table 1 of this standard. The volume percentage of each synthetic blending component, type shall be recorded along with its originator and originator's Certificate of Quality, as specified in **6** of IS 17081.'

[*Page* 5, *Table* 1, *Sl No*. ii), f), 4), *col* 3] — Substitute 'Report as per IS 17081' *for* 'Report'.

[*Page* 6, *Table* 1, *Sl No*. iv), a), *col* 2] — Substitute 'Freezing point24) °C, *Max*' *for* 'Freezing point, °C, *Max*'.

[*Page* 6, *Table* 1, *Sl No*. v), b), *col* 4] — Substitute 'P : 31' *for* 'P : 3111)'.

[*Page* 6, *Table* 1, *Sl No*. xii)] — Delete entire row.

Price Group 3

(*Page* 6, *Table* 1, *Note* 3) — Substitute 'ISO 4406' *for* 'ISO 4406 : 1999'.

(*Page* 6, *Table* 1, *Note* 12) — Substitute the following for the existing note:

'**12**. Defence requirement.'

(*Page* 6, *Table* 1, *Note* 19) — Substitute the following for the existing:

'**19**. The conductivity limits are mandatory for product to meet this specification. However, it is acknowledged that in some manufacturing and distribution systems it is more practical to inject SDA further downstream. In such cases the Certificate of Quality for the batch should be annotated thus: "Product meets requirements of IS 1571 except for electrical conductivity".The Specification Authority is also aware of situations where conductivity can decrease rapidly and the fuel can fail to respond to additional dosing of SDA (Refer Annex F.2.1 of Def Stan 91 -091 issue 10 for more information).'

(*Page* 6, *Table* 1, *Notes* 21, 22) — Delete.

(*Page* 6, *Table* 1, *Note* 23) — Insert the following new Notes 24 and 25, after Note 23:

'**24** During downstream distribution, if the freezing point of the fuel is very low and cannot be determined within the [P : 11]/IP 16/D2386 lowest achievable temperature of – 65°C, if no crystals appear during cooling of the fuel and when the thermometer indicates a temperature of – 65°C, the freezing point shall be recorded as below – 65°C. This limit does not apply if the freezing point is measured by alternate methods mentioned in Annex G.

25 Requirements of parameters of product shall not exceed the maximum nor be less than the minimum values mentioned in Table 1 when tested by the method referred to therein or Annex G.'

(*Page* 13, *clause* **E-1**) — Insert the following para at the end:

'Special care shall be taken to ensure homogeneity when blending with jet fuel containing synthesized hydrocarbons, where the component densities are significantly different.'

(Page 13, *clause* **E-7**) — Insert the following new clause:

'**E-8** Aviation fuel shall be handled and documented in the distribution chain as per the detailed guidance on Jet fuel manufacturing, distribution and handling documented in the Industry document "Aviation Quality Control and Assurance Manual" (AQCAM) approved by DGCA.

E-9 PRODUCT CERTIFICATION AND TRACEABILITY

E-9.1 Product Certification Documentation

E-9.1.1 *Key Documentation*

Aviation fuel quality assurance is based on certification at point of manufacture and procedures to verify that the quality of the aviation fuel concerned remains within the defined limits of the standard and has not changed significantly during distribution and delivery to aircraft. Proper documentation is an essential part of this process. Valid product certificates are:

a) Refinery Certificate of Quality (RCQ),
b) Certificate of Analysis (CoA),
c) Quality Control Release Certificate (QCRC), and
d) Dormancy / Recertification Test (RT) as defined in AQCAM.

E-9.1.2 *Refinery Certificate of Quality (RCQ)*

E-9.1.2.1 The RCQ is produced at the point of manufacture and is the definitive original document describing the quality of a batch of aviation fuel. It contains the results of measurements, made by the product originator's laboratory, of all the properties listed in Table 1 as well as those additional testing requirements detailed in IS 17081 for fuels containing synthesised components where appropriate. It also provides information regarding the addition of additives, including both type and amount of any such additives as permitted at **3.2**.

E-9.1.2.2 The minimum information requirements to be included on the fuel's Refinery Certificate of Quality are given at **E-4**.

E-9.1.2.3 An independent laboratory working on behalf of a refinery can produce the RCQ, but the certificate shall state the name and address of the manufacturing source refinery. In the case of fuels containing synthesised components, the point of manufacture and blending of the finished fuel shall be stated, along with the original source location and certification references for the blend components used if the points of manufacture are different.

E-9.1.3 *Certificate of Analysis (CoA)*

E-9.1.3.1 A CoA is issued by independent inspectors and/or laboratories and contains the results of measurements made of all the Table 1 properties but does not necessarily contain or provide information regarding those identified as being required at point of manufacture or the type and amount of any additives or percentage of synthetic or hydro-processed components. If additives have been added the quantity added and qualification reference shall be recorded. It shall be dated and signed by an authorised signatory. Typically CoAs are produced downstream of refineries in intermediate supply terminals or intermediate storage locations but may also be produced at refineries where finished product is imported.

NOTE — A Certificate of Analysis shall not be treated as a Refinery Certificate of Quality.

E-9.1.4 *QC Release Certificates (QCRC)*

The Release Certificate for any transfer of aviation fuel, shall contains minimum information stated in AQCAM.

E-9.1.5 *Recertification/Dormancy Test Certificates (RT Certificate)*

Sample shall be checked for Dormancy / Recertification test as per AQCAM.

E-9.1.6 *Documentation Requirements for Supply to Airports*

For supply into airports, product shall be supported by a valid test certificate as defined in **E-9.1**. The certificate shall be less than 180 days old. Where the RCQ, CoA or RT is more than 180 days old, a new CoA shall be issued.

NOTE — Drum stocks are an exception to this requirement. Here the certification is valid for 12 months from filling date or last re-test date for the batch of drums.

E-9.2 Traceability

E-9.2.1 Traceability for aviation turbine fuel is defined as the ability to track distinct batches of fuel through the distribution system back to the original point of manufacture using the correct documentation. This requires batch volume and quality documentation with information on additive concentration, hydro-processed content and synthetic components (if present, *see* IS 17081) to be maintained.

E-9.2.2 *Minimum Documentation Requirements*

To ensure compliance to minimum documentation requirement at each point in the supply chain, traceability shall be fulfilled by listing unique identifier of the appropriate quality document (RCQ, CoA, QCRC & RT) as detailed defined in Industry approved document AQACM approved by DGCA.

E-9.2.3 *Fungible Distribution Systems*

It is acknowledged that in some fungible pipeline systems traceability and documentation of specific batches cannot be maintained because batches are added and subtracted during transportation along the pipeline. In such cases, all batches entering the fungible pipeline system shall have full documentation (RCQ, CoA or RT) to ensure compliance with this Standard.

E-9.2.4 *Distribution System Blending*

When certifying a mixture of batches as Jet A-1 meeting IS 1571 downstream of the original manufacturing site, the guiding principle is that the batches should have been originally manufactured as jet fuel and subsequently handled and stored as jet fuel. The dosage and specification of Synthesized Hydrocarbon Components are defined in IS 17081.

(*Page* 14, *clause* **F-1.2**) — Substitute the following for the existing clause:

'**F-1.2** It is therefore not possible for this standard to list maximum levels and test methods for all the possible materials that could be unintentionally present in jet fuel. In this standard, the potential risk posed by incidental materials is managed in two ways. Firstly, there is a requirement that manufacturing and distribution locations shall ensure that they have adequate quality assurance and management of change procedures in place to maintain product integrity. Secondly, for identified materials where the requirements of this section cannot be assured, specific maximum limits are defined. Currently two such incidental materials are included in this category and their maximum limits are listed below in Table 2.

Table 2 Requirement for Identified Incidental Materials

(*Clause* F- 1.2)

Sl No.	**Characteristic**	**Requirement**	**Method of Test, Ref to [P:] of IS 1448/ASTM/IP/ISO**
(1)	(2)	(3)	(4)
i)	Fatty Acid Methyl Ester[1], mg/kg, *Max*	50[2,3]	D 7797/ IP 583, IP 585[4], IP 590, IP 599
ii)	Pipeline Drag Reducer (DRA)	72 µg/L [5]	D 7872

NOTES

1 For the purposes of meeting this requirement, FAME is defined as material meeting the limits of IS 15607 or EN14214 or ASTM D6751. Fatty acid methyl esters that fail to meet biodiesel standards are not permitted in jet fuel.

2 On an emergency basis, up to 100 mg/kg FAME is permitted in jet fuel when authorised by the airframe and engine manufacturers and managed in compliance with airframe and engine requirements. For Military purposes an emergency basis can be defined as an unexpected and unforeseen situation that requires prompt action. For example where FAME contamination has been introduced into part of an airport distribution system where it cannot be quickly segregated or isolated for remediation without halting airport refuelling operations. All such instances should be raised through the procurement Authority, Duty Holder or Aircraft Operator. For commercial operators refer to SAIB NE-09-25R2 dated May 19, 2016, which provides corrective actions and procedures to be followed in the event of FAME contamination.

3 Post manufacture a risk assessment shall be undertaken to quantify the potential risk of FAME carryover in all supply chains. Where such assessments indicate that there could be a potential risk in jet fuel supplies, additional quality assurance procedures shall be introduced to increase control in order to mitigate the risk. Where the risk of FAME carryover exists and it is not possible to control with additional quality assurance procedures, testing shall be instigated. Details guidance how to verify compliance with this requirement is contained in Annex 'F'.

The 50 mg/kg max FAME requirement is met by a risk based assessment without the need to test. In systems where FAME contamination is physically prevented then there is no requirement for FAME testing. Examples are at the Refinery and or Distribution network where Jet fuel is positively segregated thru dedicated pipeline system and isolated from FAME containing components. The RCQ / COQ shall state 'Not measured - Risk Assessed in accordance with JIG Bulletin 106' against the FAME result.

4 Denotes referee method.

5 DRA is not an approved additive for jet fuel. This level is accepted by approval authorities as the functional definition of 'nil addition'. Pipeline drag reducing additives (DRAs) may be present in non-aviation products during transportation thru multi product pipeline system. It is essential that strict controls are in place to avoid any contamination of Jet fuel with DRAs in case of movement of Jet Fuel thru multi product pipeline transportation system. The injection of DRA into other products preceding a Jet fuel parcel shall be stopped sufficiently in advance to avoid any possibility of the Jet fuel picking up traces of DRA. Wherever DRA is used in pipelines that transport Jet fuel, a risk assessment shall be undertaken to determine whether the use of ASTM D 7872 is necessary or not for ongoing regular movement of Jet A-1.

(*Page* 14, *clause* **F-4.3**) — Substitute '106' *for* '75'.

(*Page* 14, *clause* **F-4.4**, *line* 9) — Delete last sentence.

(PCD 03)

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